Energy & Climate Change: The Dow Commitment & Challenge

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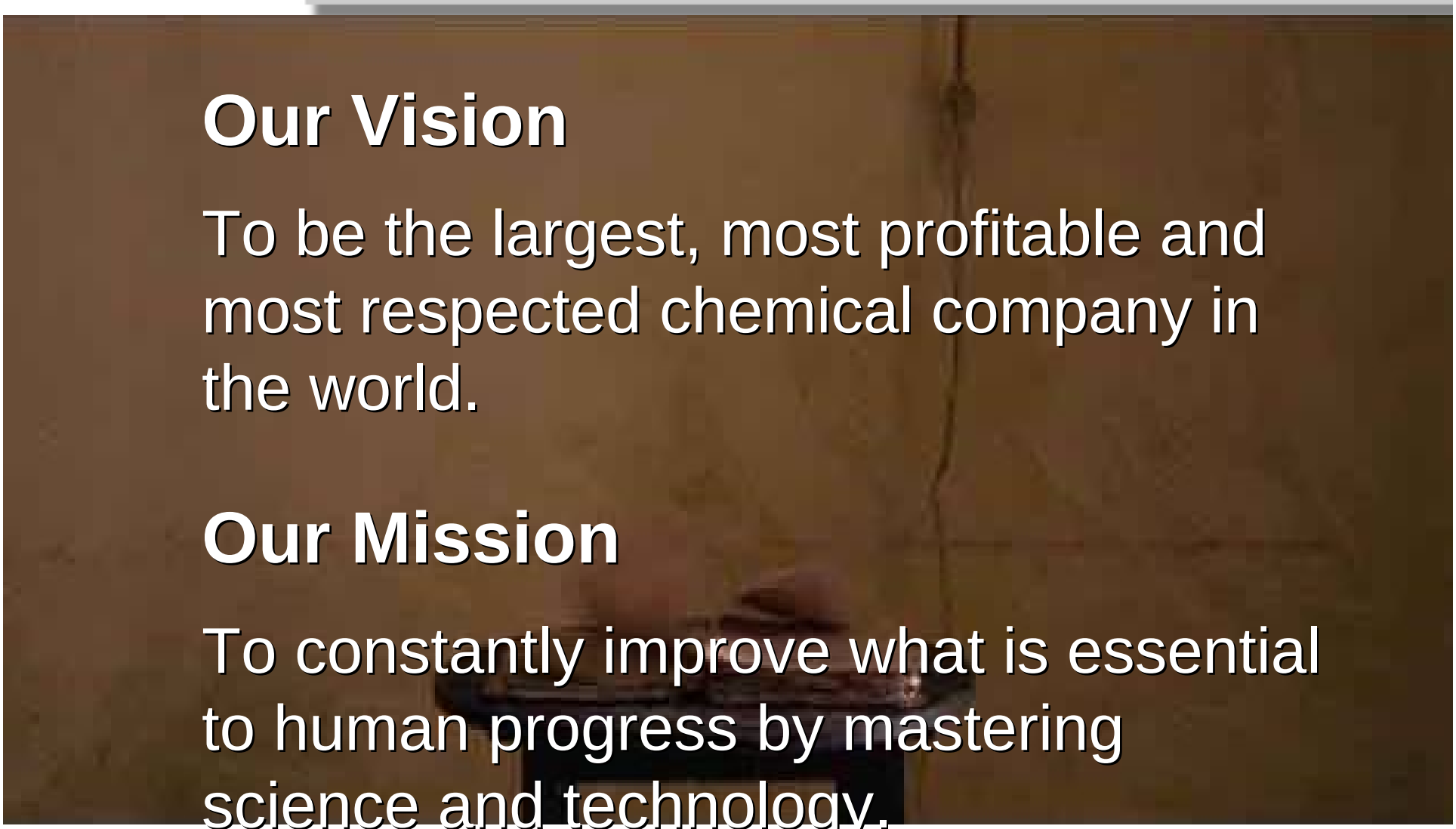

Our Vision

To be the largest, most profitable and most respected chemical company in the world.

Our Mission

To constantly improve what is essential to human progress by mastering science and technology.

About Dow

- Diversified chemical company, harnessing the power of science and technology to improve living daily
- Founded in Midland, Michigan in **1897**
- Supplies more than **3,300 products** to customers in **175 countries**
- Annual sales of $**54 billion**
- **46,000 employees** worldwide
- Committed to **Sustainability**

Acquisition of R&H
K-Dow JV

Creating Products from Energy & Feedstocks

Hydrocarbons & Energy Locations

Issues From a Dow Perspective

- Rising Energy

➢Climate Change

Corporate Risk & Business Opportunity

Importance of Energy to Dow

Energy & Feedstock Security

- World's largest industrial consumer of power and steam
  - Operates over **$6.2 billion** in energy assets & **supports $2.5 billion** (and growing) in JV assets
  - Requires **>3,700 MW** of electricity & **>20 Million Lbs/Hr of steam** to operate
  - Energy equivalent to 2/3rds the residential energy use for the entire state of California
  - At $8/MMBTU natural gas equivalent fuel cost, Dow steam and power bill alone is **~$5 Billion per year**
- It is not just about Energy
  - Petrochemical Industry's raw materials are energy, natural gas liquids, naphtha
  - Feedstock & Energy demand is **850,000 barrels/day**, estimated value ~$32 billion/year in 2008
  - 40-50% of Dow's total annual operating costs and expenses

Energy & Feedstock Security

- 60 petrochemical plants >$1 B announced in next decade, none in US
- The price for natural gas in the ME is about 1/10th of that in the U.S. today
- US imports 60% of its oil
- US imports about 16% of its natural gas

National Security

What if We Imported Most of the Basic Chemicals that We Rely on Every Day?

*Did you know that **ME can land chemicals & plastics here in the U.S. for the equivalent cost of $4.50/MMBTU while Henry Hub price is about $9/MMBTU?***

Climate Change

- 80% of the Energy we use is derived from Fossil Fuels
- Fossil Fuels = GHGs

Energy Crossroads:

“you can’t have one without the other”

- **Energy Security**
- **Feedstock Security**
- **National Security**
- **Climate Change**

What Can We Do?

- **Public and Elected Officials Must Understand Need for a Comprehensive Energy Policy**
  - U.S. Chemical Industry went from a $20 B trade surplus to a $9 B trade deficit in the past decade
  - US EIA data show that 3 million jobs have been lost since the run up in natural gas prices in late 1990s
  - U.S. Petroleum Imports are now about 10 million BBL/Day. At $120/BBL, that is $1.2 B per day of trade deficit or about $438 B per year

First – Energy Efficiency

- **Energy Efficiency**
  - It saves money, it does not require new fossil fuels, and it reduced GHGs
  - **However, Energy Efficiency Alone Will Not Solve our Crisis**

Second – Expand Supplies

- **We Must Expand Our Own Supplies of Energy**

Third – Diversify Fuels & Feedstocks

- **Nuclear**
- **Clean Coal**
- **Coal to Gas, Coal to Chemicals**
- **Bio Feedstocks**
- **Renewables**
  - Solar, Tidal, Wind, Hydro

Nuclear & Synthetic Feedstocks

- **Nuclear** (and any other non C based energy source)
  - E.g., HTGR, plus
- **Carbon**
  - E.g., Coal, Pet coke, switch grass, even CO2, plus
- **Water** – H2 production
    - Not a H2 economy, yields
- **CO2 free** (avoid shift Rx) synthetic feedstocks & fuels that,
  - Do not require new infrastructure for transport & use

Fourth –Research & Infrastructure

- **More Basic Research in Energy**
- **Improved Infrastructure**
  - Upgrade aging coal assets & transmission
  - Nuclear to chemicals
  - Storage of energy

Bottom Line

- **Energy Security, Feedstock Security, National Security, and Climate Change are Inseparable**
- **U.S. Needs a <u>Comprehensive</u> Energy Strategy**


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